OIPE JC102 JAN 07 2004 PATENT & TRADEMARK OFFICE

FIG. 1

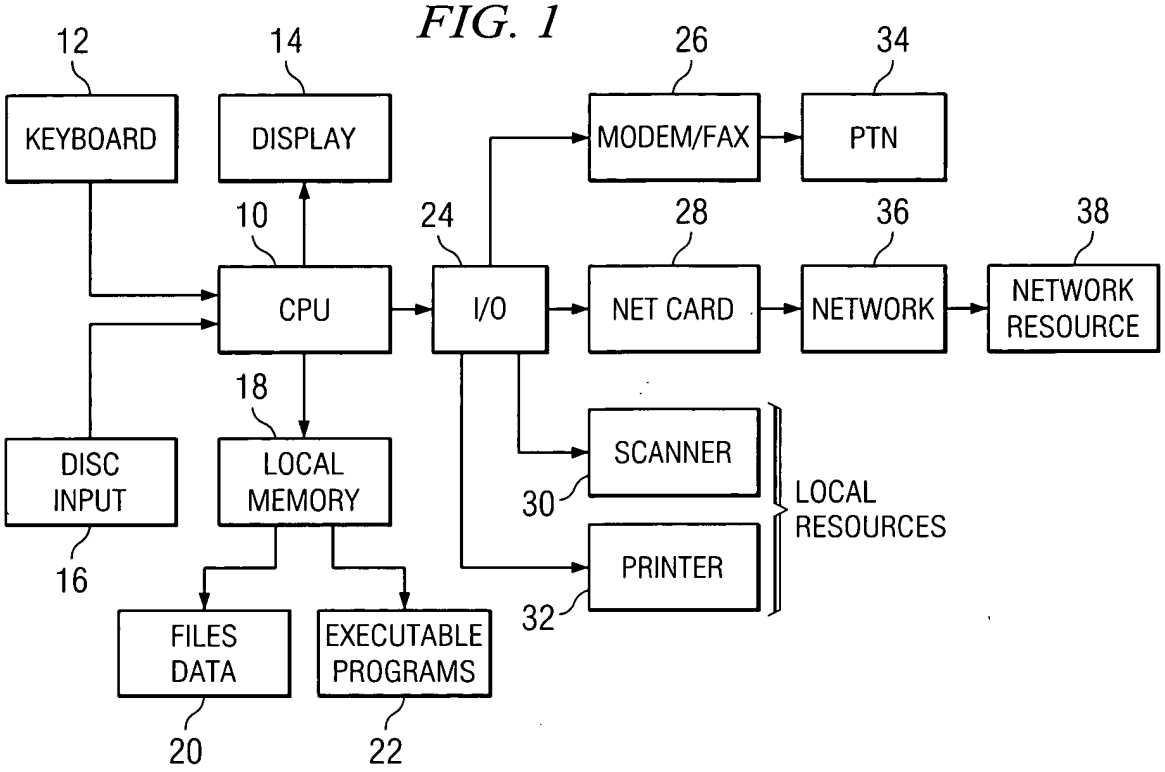


FIG. 2
(PRIOR ART)

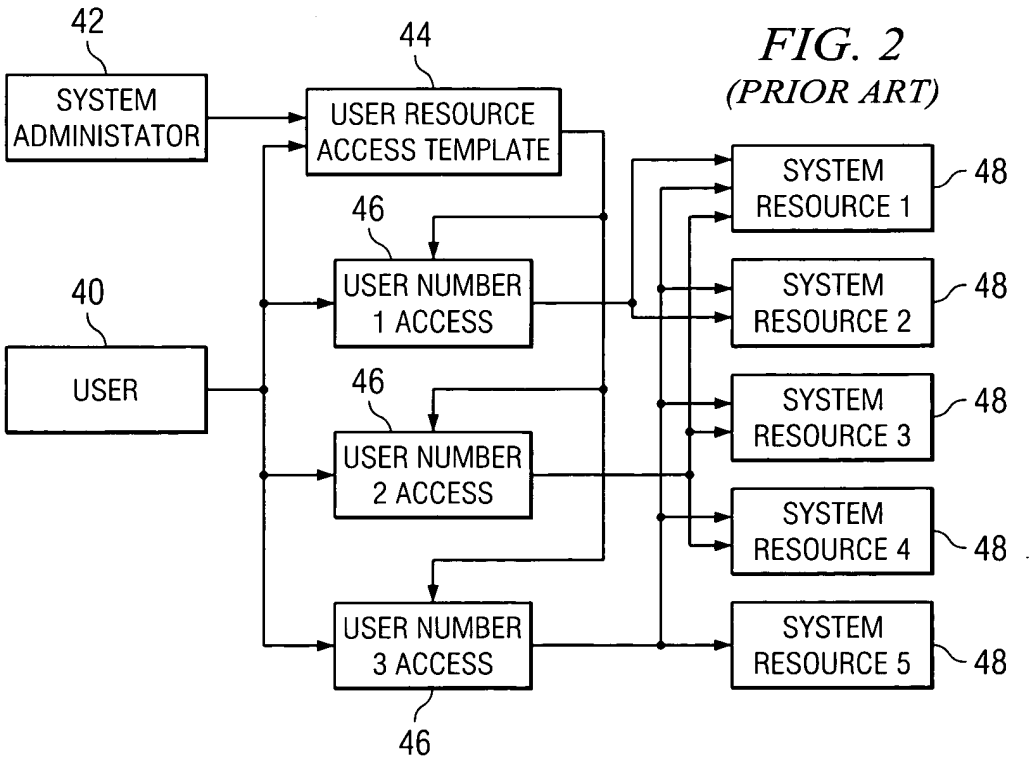


FIG. 3

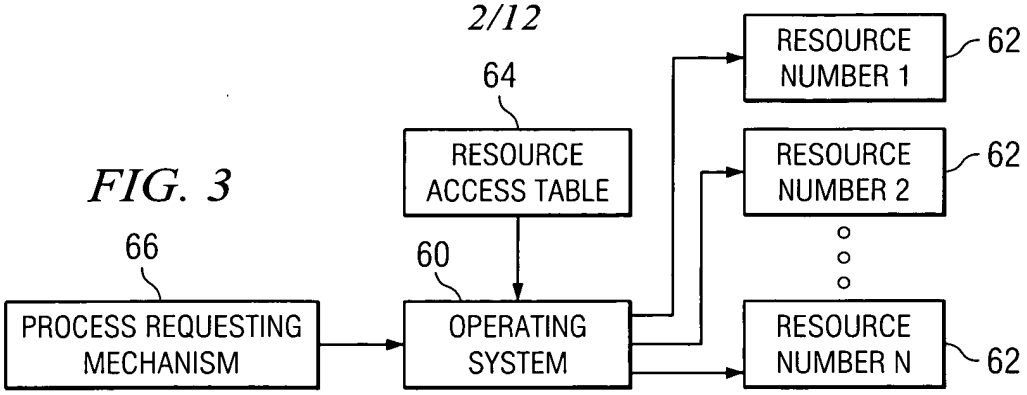

64
RESOURCE ACCESS TABLE
RESOURCE NUMBER 1
62
RESOURCE NUMBER 2
62
66
60
PROCESS REQUESTING MECHANISM
OPERATING SYSTEM
RESOURCE NUMBER N
62

FIG. 4

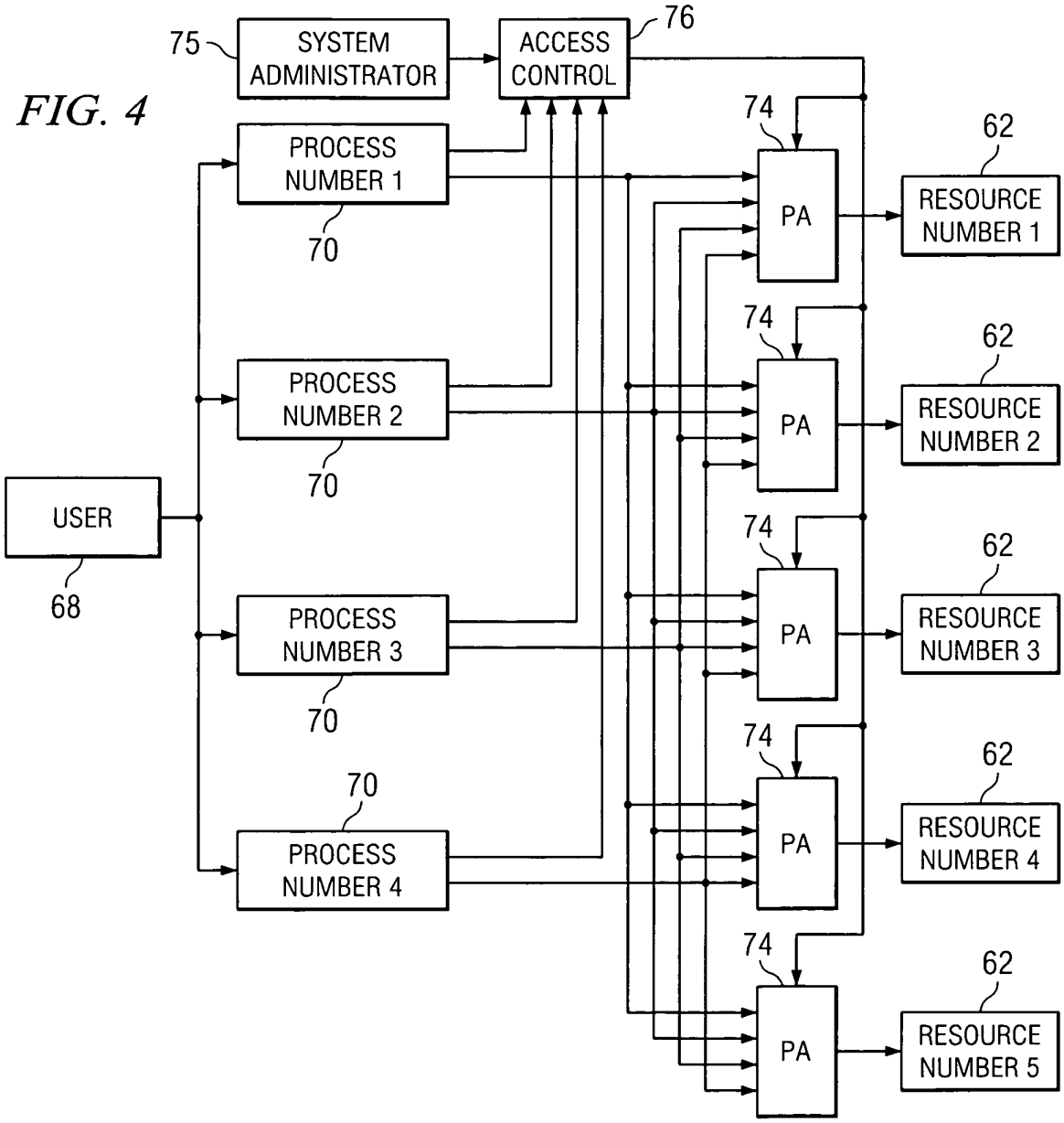

75
SYSTEM ADMINISTRATOR
ACCESS CONTROL
76
PROCESS NUMBER 1
70
PROCESS NUMBER 2
70
USER
68
PROCESS NUMBER 3
70
70
PROCESS NUMBER 4
74
PA
62
RESOURCE NUMBER 1
74
PA
62
RESOURCE NUMBER 2
74
PA
62
RESOURCE NUMBER 3
74
PA
62
RESOURCE NUMBER 4
74
PA
62
RESOURCE NUMBER 5

FIG. 5

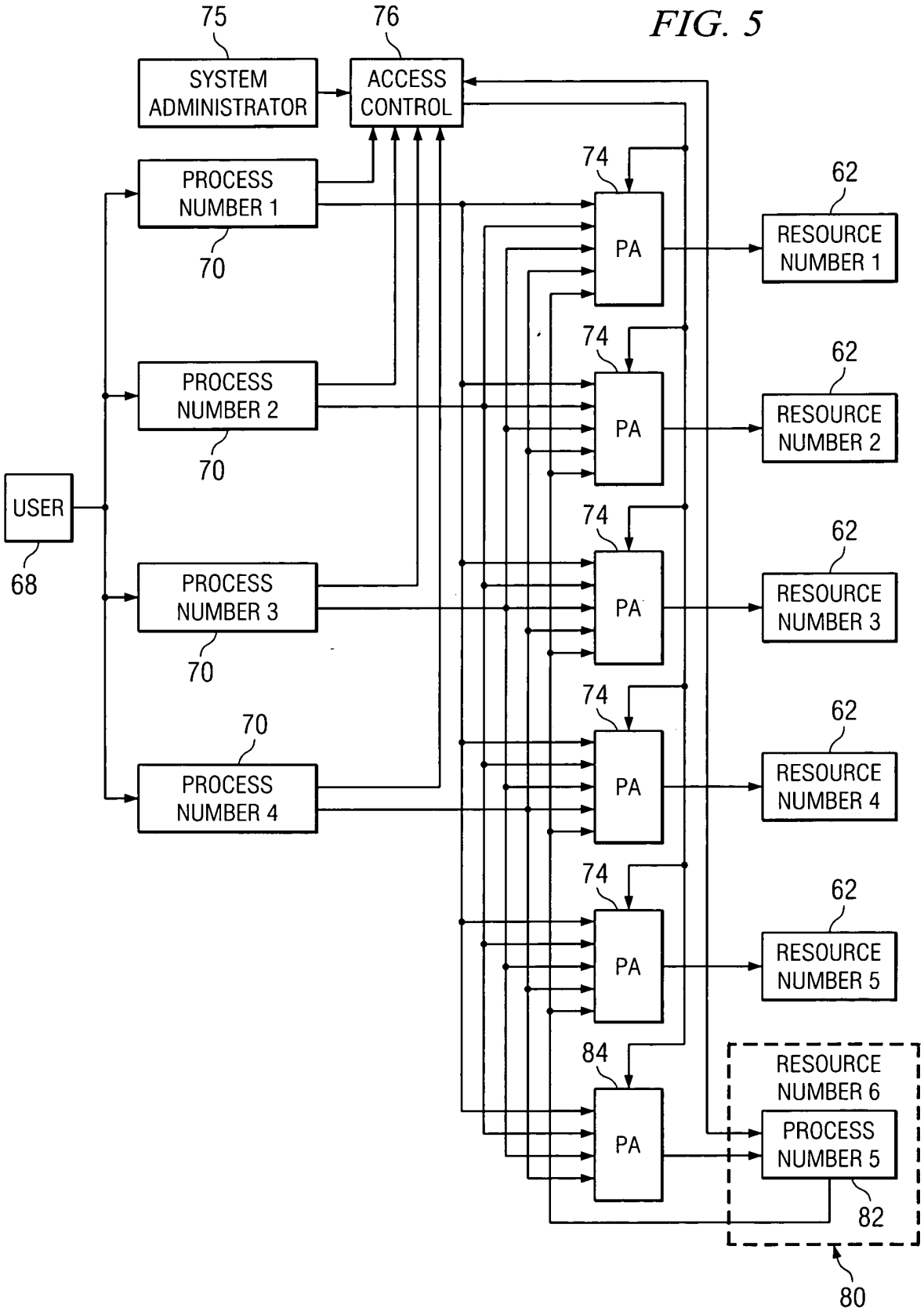

75
76
SYSTEM ADMINISTRATOR
ACCESS CONTROL
PROCESS NUMBER 1
70
PROCESS NUMBER 2
70
USER
68
PROCESS NUMBER 3
70
70
PROCESS NUMBER 4
74
PA
62
RESOURCE NUMBER 1
74
PA
62
RESOURCE NUMBER 2
74
PA
62
RESOURCE NUMBER 3
74
PA
62
RESOURCE NUMBER 4
74
PA
62
RESOURCE NUMBER 5
84
PA
RESOURCE NUMBER 6
PROCESS NUMBER 5
82
80

FIG. 6

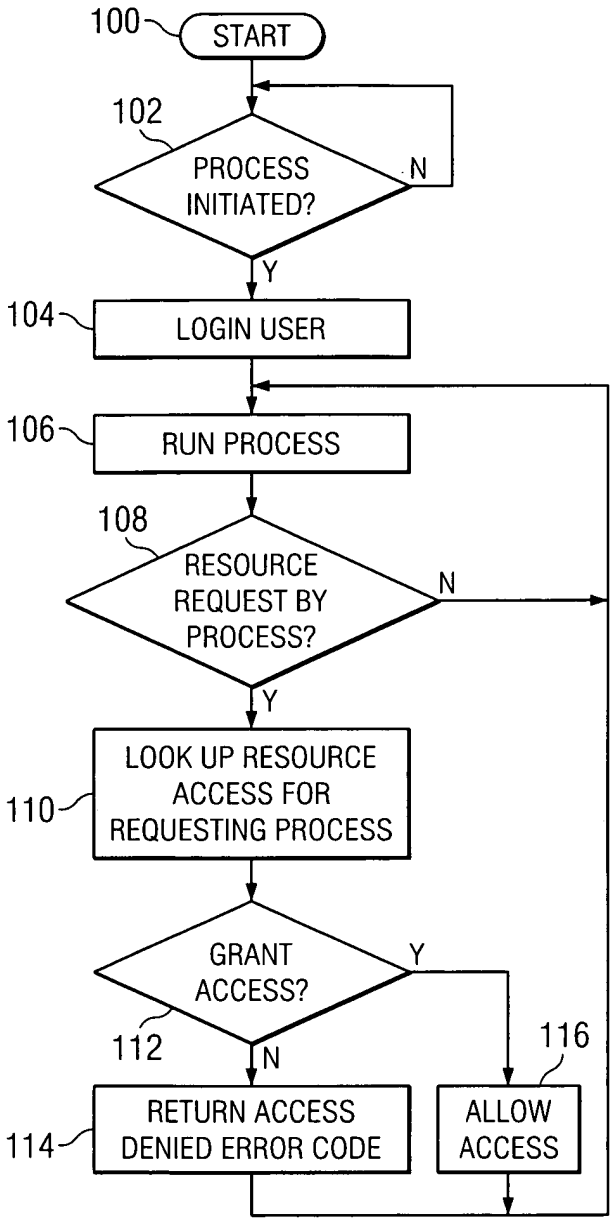

100
START
102
PROCESS INITIATED?
N
Y
104
LOGIN USER
106
RUN PROCESS
108
RESOURCE REQUEST BY PROCESS?
N
Y
110
LOOK UP RESOURCE ACCESS FOR REQUESTING PROCESS
GRANT ACCESS?
Y
112
N
116
114
RETURN ACCESS DENIED ERROR CODE
ALLOW ACCESS

FIG. 7

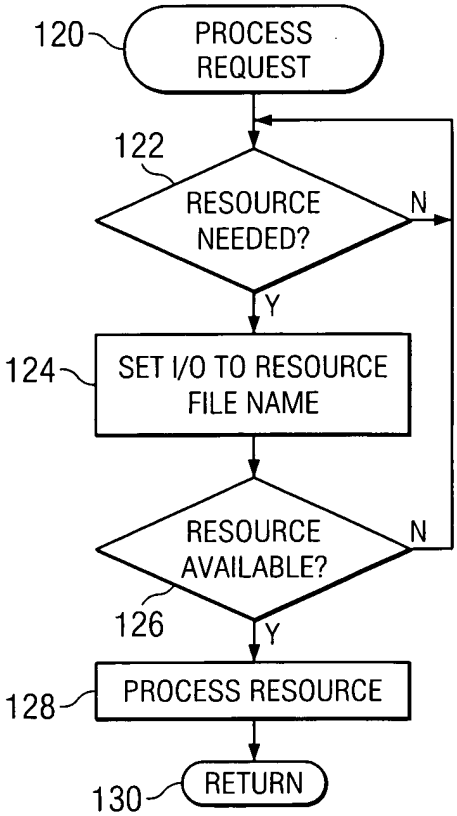

120
PROCESS REQUEST
122
RESOURCE NEEDED?
N
Y
124
SET I/O TO RESOURCE FILE NAME
RESOURCE AVAILABLE?
N
126
Y
128
PROCESS RESOURCE
130
RETURN

FIG. 8

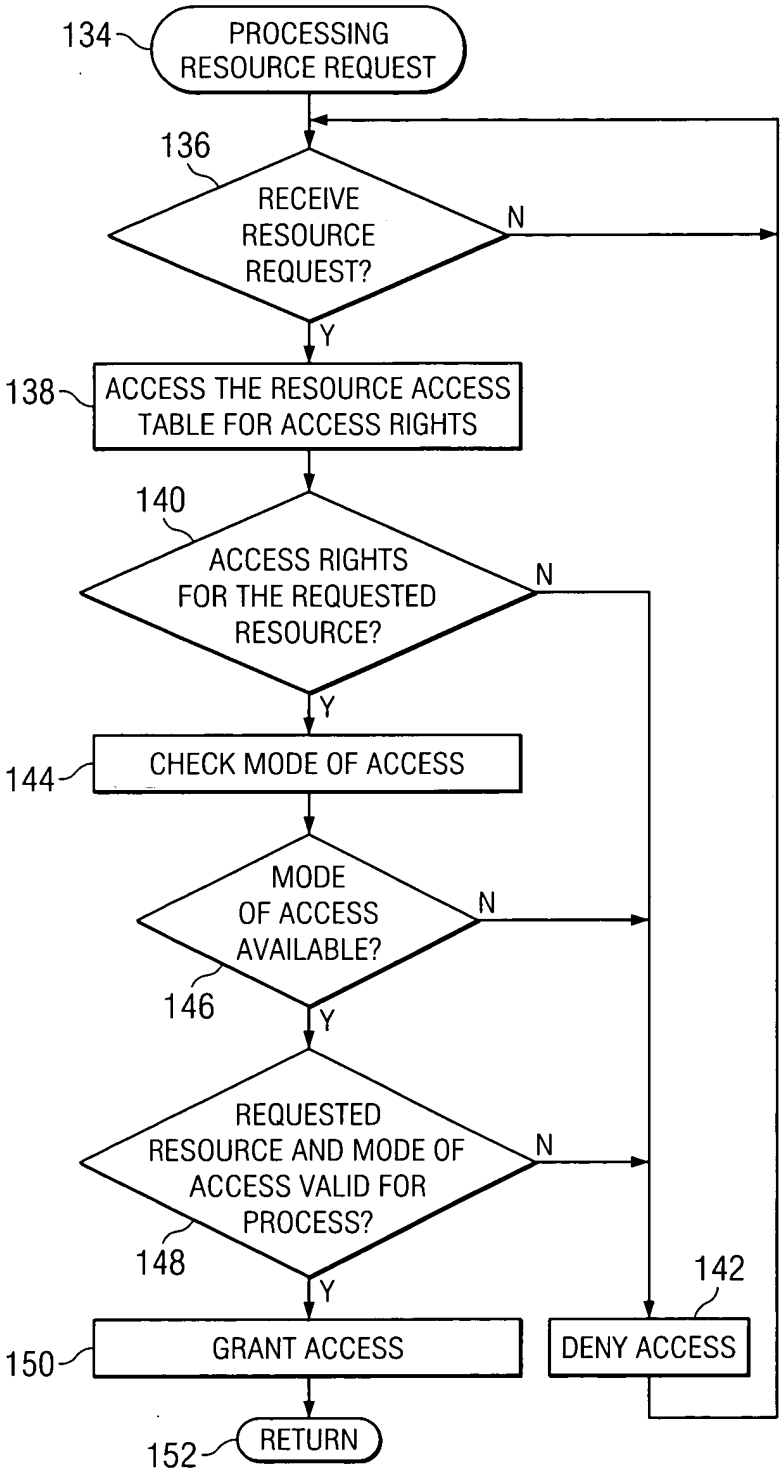

134
PROCESSING RESOURCE REQUEST
136
RECEIVE RESOURCE REQUEST?
N
Y
138
ACCESS THE RESOURCE ACCESS TABLE FOR ACCESS RIGHTS
140
ACCESS RIGHTS FOR THE REQUESTED RESOURCE?
N
Y
144
CHECK MODE OF ACCESS
MODE OF ACCESS AVAILABLE?
N
146
Y
REQUESTED RESOURCE AND MODE OF ACCESS VALID FOR PROCESS?
N
148
Y
142
150
GRANT ACCESS
DENY ACCESS
152
RETURN

FIG. 9

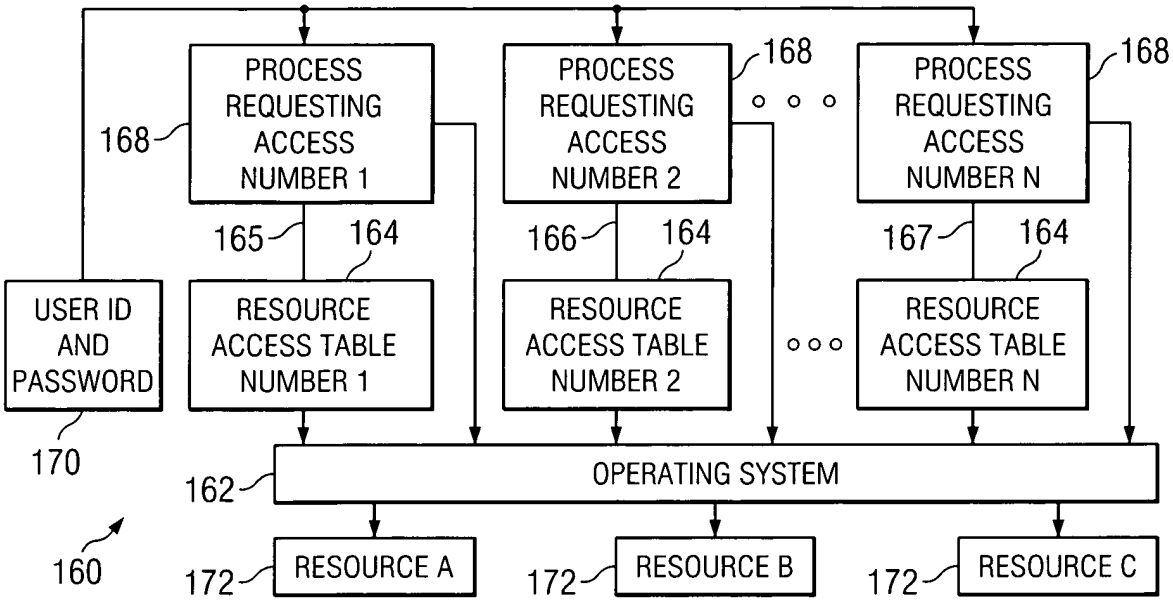

PROCESS REQUESTING ACCESS NUMBER 1
PROCESS REQUESTING ACCESS NUMBER 2
PROCESS REQUESTING ACCESS NUMBER N
168
168
168
165
164
166
164
167
164
USER ID AND PASSWORD
RESOURCE ACCESS TABLE NUMBER 1
RESOURCE ACCESS TABLE NUMBER 2
RESOURCE ACCESS TABLE NUMBER N
170
162
OPERATING SYSTEM
160
172
RESOURCE A
172
RESOURCE B
172
RESOURCE C

FIG. 10

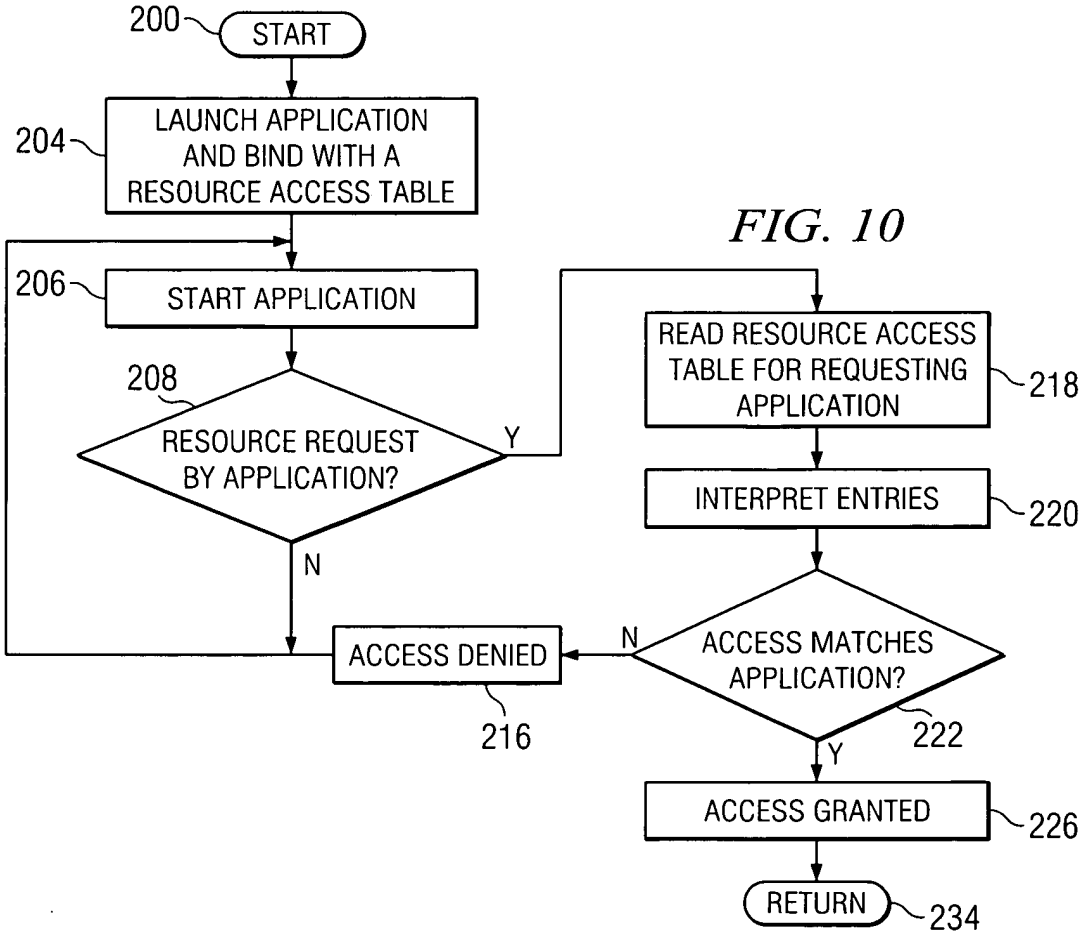

200
START
204
LAUNCH APPLICATION AND BIND WITH A RESOURCE ACCESS TABLE
206
START APPLICATION
208
RESOURCE REQUEST BY APPLICATION?
Y
N
ACCESS DENIED
216
READ RESOURCE ACCESS TABLE FOR REQUESTING APPLICATION
218
INTERPRET ENTRIES
220
ACCESS MATCHES APPLICATION?
N
222
Y
ACCESS GRANTED
226
RETURN
234

FIG. 11

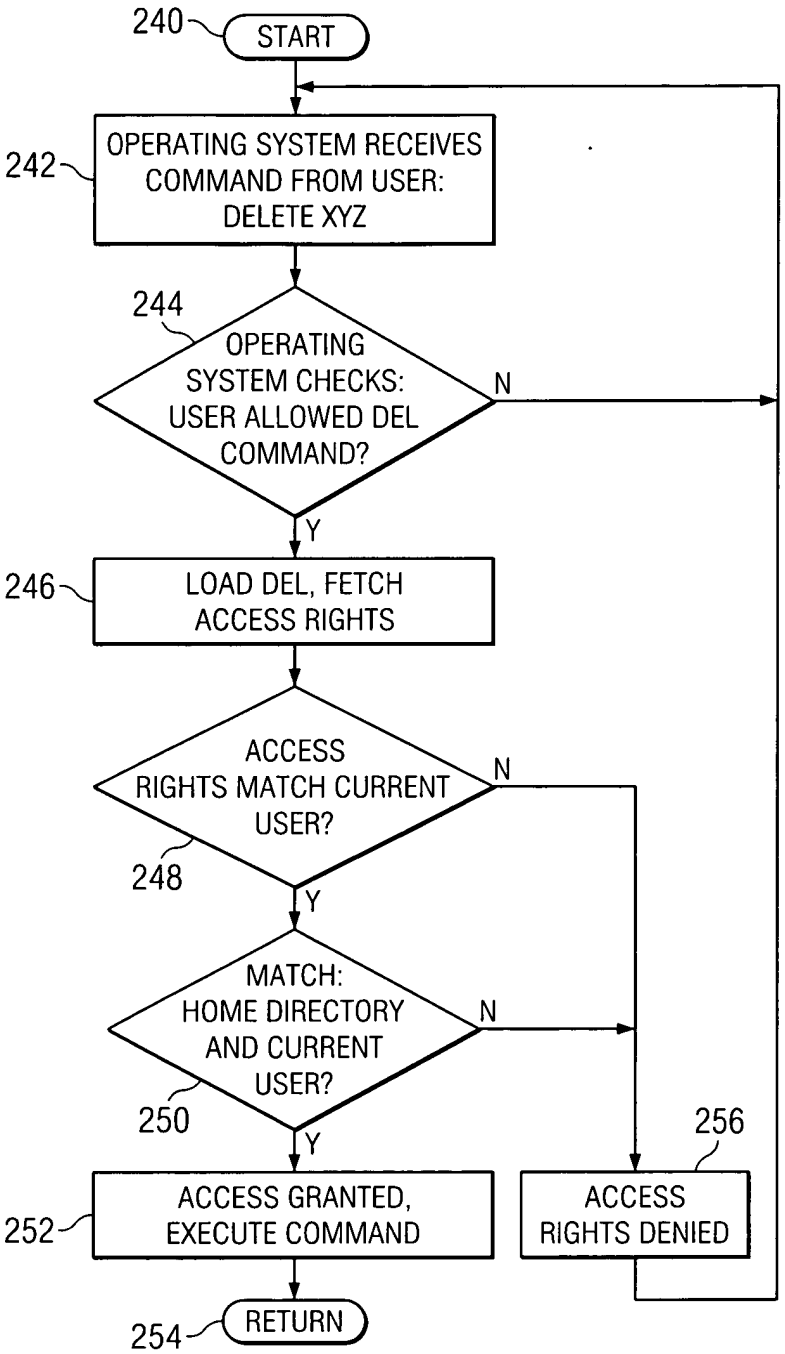

240
START
242
OPERATING SYSTEM RECEIVES COMMAND FROM USER: DELETE XYZ
244
OPERATING SYSTEM CHECKS: USER ALLOWED DEL COMMAND?
N
Y
246
LOAD DEL, FETCH ACCESS RIGHTS
ACCESS RIGHTS MATCH CURRENT USER?
N
248
Y
MATCH: HOME DIRECTORY AND CURRENT USER?
N
250
Y
256
252
ACCESS GRANTED, EXECUTE COMMAND
ACCESS RIGHTS DENIED
254
RETURN

FIG. 12

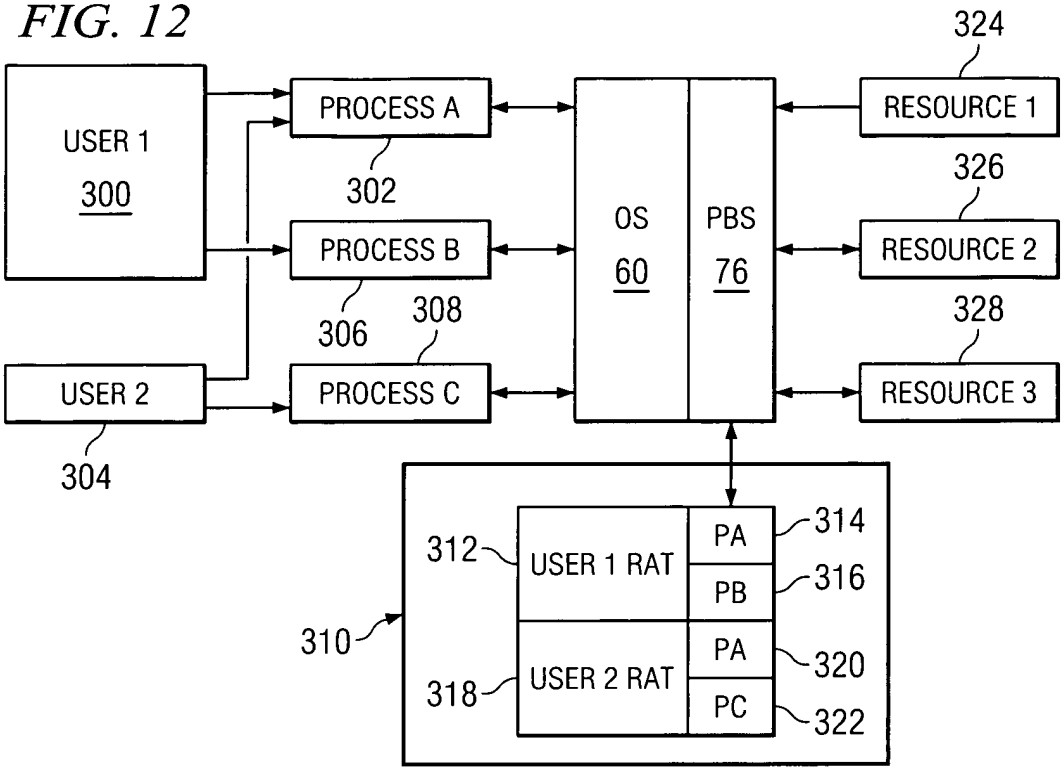

USER 1
300
USER 2
304
PROCESS A
302
PROCESS B
306
PROCESS C
308
OS
60
PBS
76
RESOURCE 1
324
RESOURCE 2
326
RESOURCE 3
328
310
312
USER 1 RAT
PA
314
PB
316
318
USER 2 RAT
PA
320
PC
322

FIG. 14

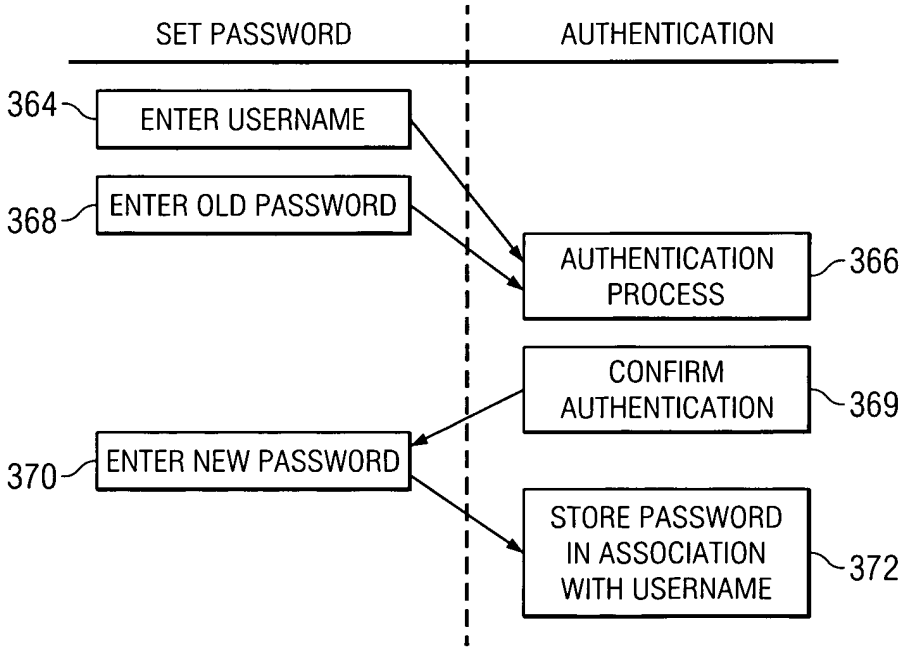

SET PASSWORD
AUTHENTICATION
364
ENTER USERNAME
368
ENTER OLD PASSWORD
AUTHENTICATION PROCESS
366
CONFIRM AUTHENTICATION
369
370
ENTER NEW PASSWORD
STORE PASSWORD IN ASSOCIATION WITH USERNAME
372

FIG. 13

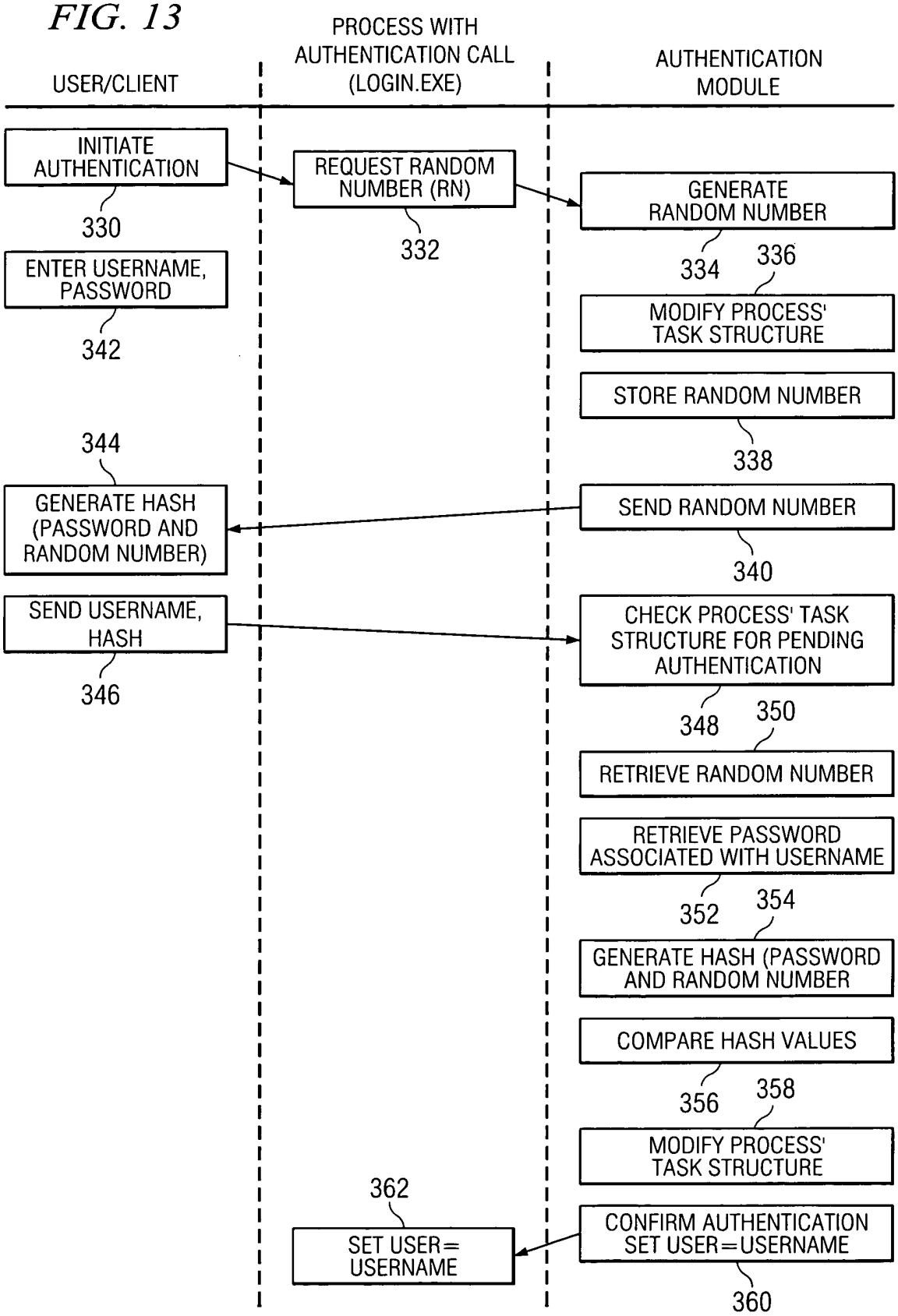

USER/CLIENT
PROCESS WITH AUTHENTICATION CALL (LOGIN.EXE)
AUTHENTICATION MODULE
INITIATE AUTHENTICATION
330
REQUEST RANDOM NUMBER (RN)
332
GENERATE RANDOM NUMBER
334
336
MODIFY PROCESS' TASK STRUCTURE
ENTER USERNAME, PASSWORD
342
STORE RANDOM NUMBER
338
344
GENERATE HASH (PASSWORD AND RANDOM NUMBER)
SEND RANDOM NUMBER
340
SEND USERNAME, HASH
346
CHECK PROCESS' TASK STRUCTURE FOR PENDING AUTHENTICATION
348
350
RETRIEVE RANDOM NUMBER
RETRIEVE PASSWORD ASSOCIATED WITH USERNAME
352
354
GENERATE HASH (PASSWORD AND RANDOM NUMBER
COMPARE HASH VALUES
356
358
MODIFY PROCESS' TASK STRUCTURE
362
SET USER= USERNAME
CONFIRM AUTHENTICATION SET USER=USERNAME
360

FIG. 15

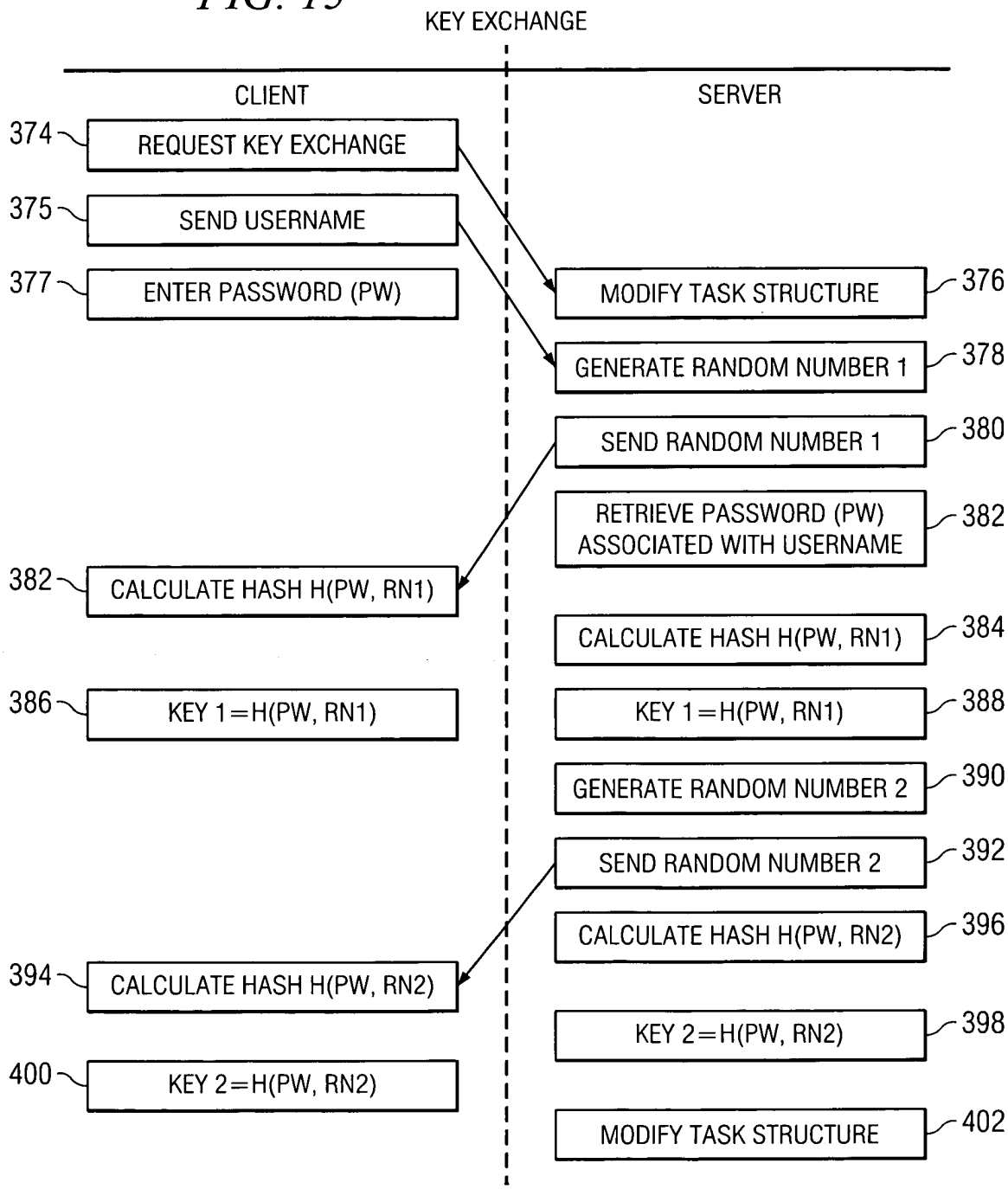

KEY EXCHANGE
CLIENT
SERVER
374
REQUEST KEY EXCHANGE
375
SEND USERNAME
377
ENTER PASSWORD (PW)
MODIFY TASK STRUCTURE
376
GENERATE RANDOM NUMBER 1
378
SEND RANDOM NUMBER 1
380
RETRIEVE PASSWORD (PW) ASSOCIATED WITH USERNAME
382
382
CALCULATE HASH H(PW, RN1)
CALCULATE HASH H(PW, RN1)
384
386
KEY 1=H(PW, RN1)
KEY 1=H(PW, RN1)
388
GENERATE RANDOM NUMBER 2
390
SEND RANDOM NUMBER 2
392
CALCULATE HASH H(PW, RN2)
396
394
CALCULATE HASH H(PW, RN2)
KEY 2=H(PW, RN2)
398
400
KEY 2=H(PW, RN2)
MODIFY TASK STRUCTURE
402

FIG. 16

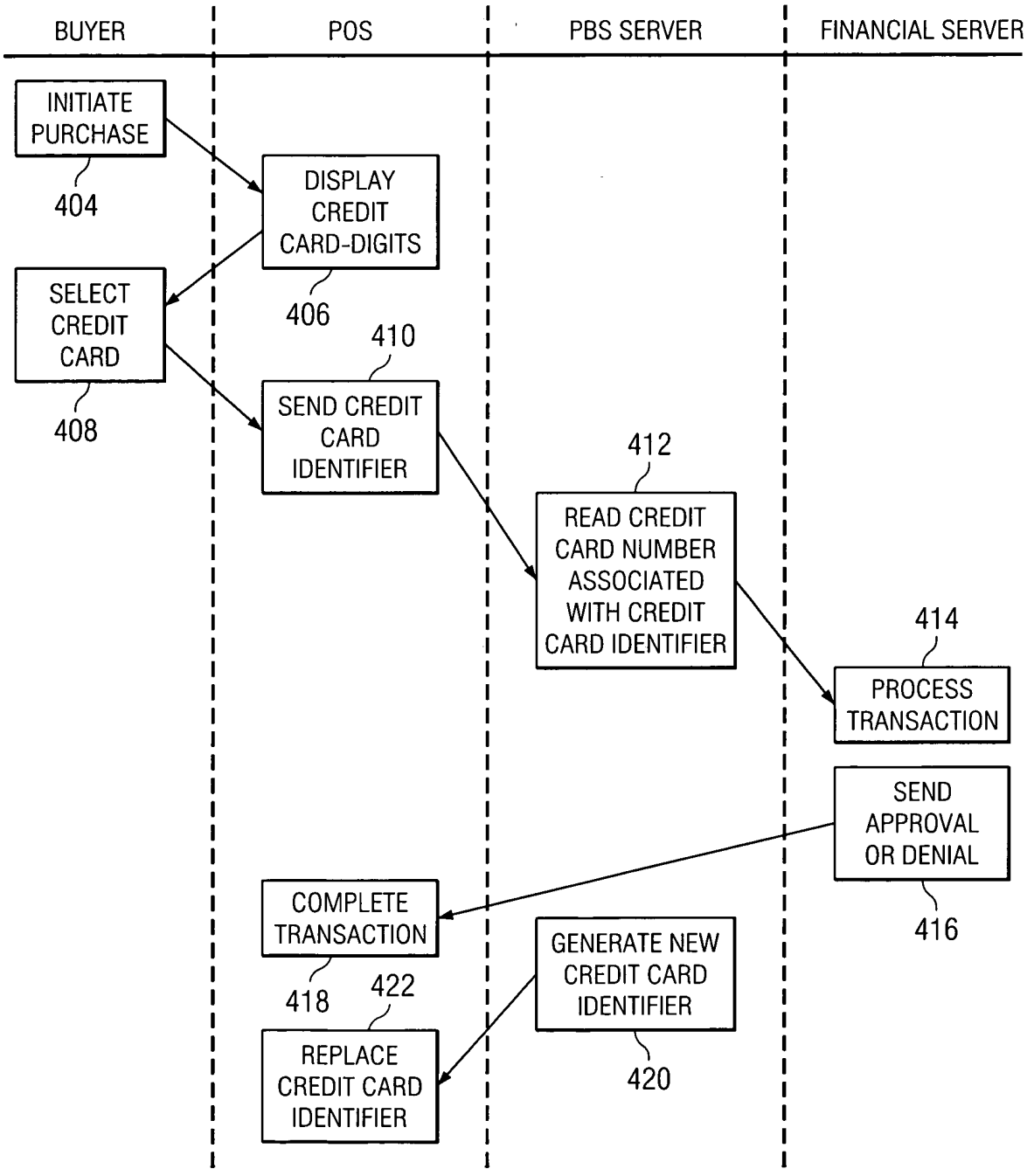

BUYER
POS
PBS SERVER
FINANCIAL SERVER
INITIATE PURCHASE
404
DISPLAY CREDIT CARD-DIGITS
406
SELECT CREDIT CARD
408
410
SEND CREDIT CARD IDENTIFIER
412
READ CREDIT CARD NUMBER ASSOCIATED WITH CREDIT CARD IDENTIFIER
414
PROCESS TRANSACTION
SEND APPROVAL OR DENIAL
416
COMPLETE TRANSACTION
418
422
REPLACE CREDIT CARD IDENTIFIER
GENERATE NEW CREDIT CARD IDENTIFIER
420

FIG. 17

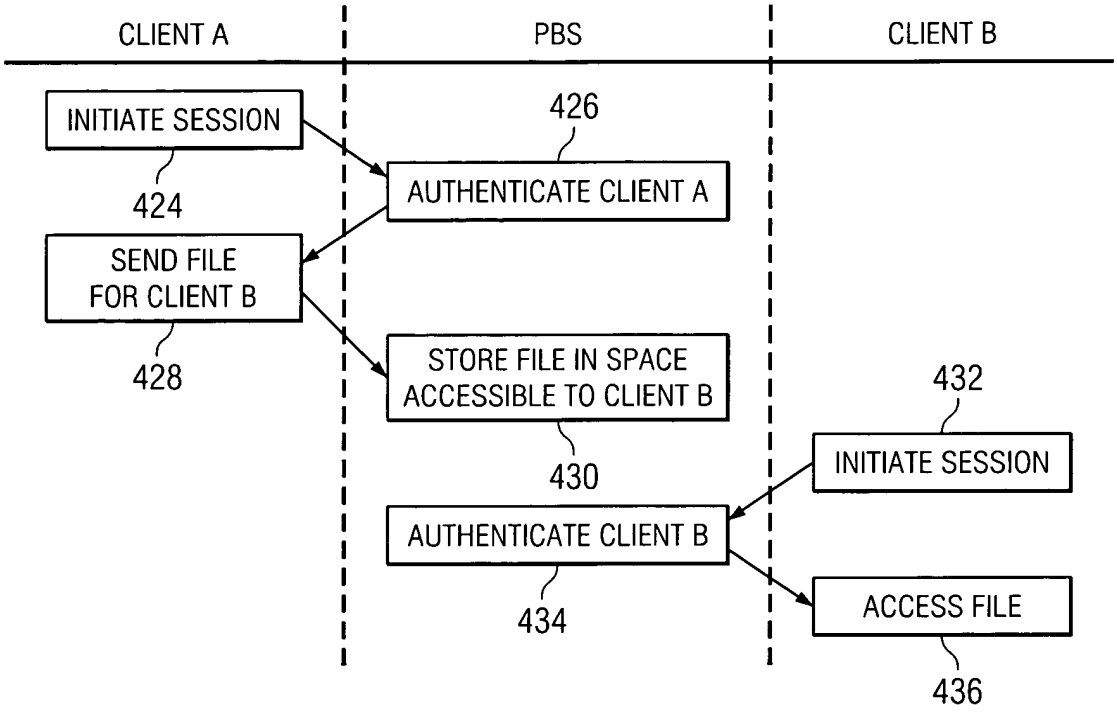
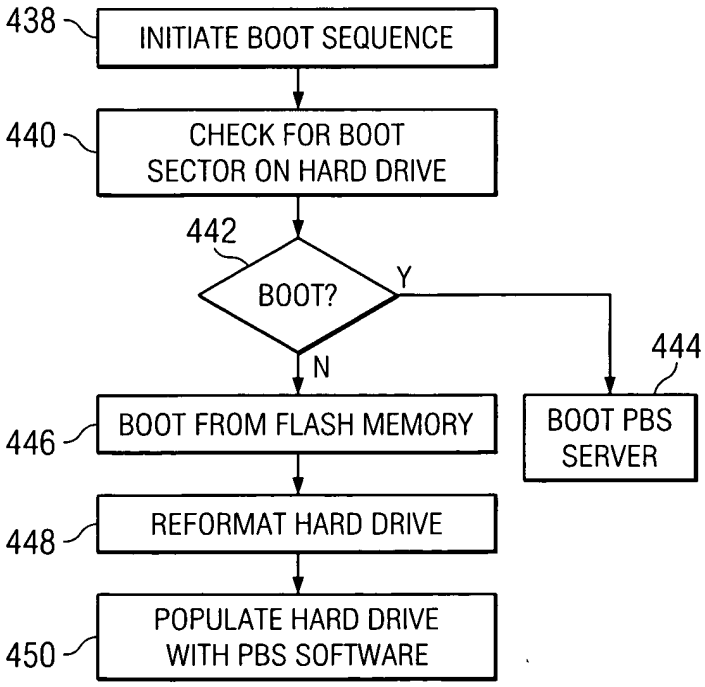

CLIENT A
PBS
CLIENT B
INITIATE SESSION
424
426
AUTHENTICATE CLIENT A
SEND FILE FOR CLIENT B
428
STORE FILE IN SPACE ACCESSIBLE TO CLIENT B
430
432
INITIATE SESSION
AUTHENTICATE CLIENT B
434
ACCESS FILE
436

FIG. 18


438
INITIATE BOOT SEQUENCE
440
CHECK FOR BOOT SECTOR ON HARD DRIVE
442
BOOT?
Y
N
444
BOOT PBS SERVER
446
BOOT FROM FLASH MEMORY
448
REFORMAT HARD DRIVE
450
POPULATE HARD DRIVE WITH PBS SOFTWARE